

iDirect Technologies Broadband VSAT System - Summary

iDirect provides the most cost-effective and reliable broadband business-class IP solution over satellite.

Simplicity

- One-Box Solution (Satellite Modem, IP Router, TCP Optimization, QoS, 3DES Link Encryption)
- Centralized Management (Software Upgrades, Configuration Changes)

Most Reliable Solution over Satellite

- First to implement Turbo Product Code (TPC) Forward Error Correction
- 10^{-9} or Better Bit-Error-Rate Guarantee
- Uses 50% lower power (E_b/N_o) when compared to RSV
- Auto Power Adjustment provides reliable connectivity even in bad weather conditions
- The ultimate result is more TCP throughput

Performance

- Highest TCP/IP throughputs in the industry (9 Mbps downstream – 4.2 Mbps Upstream)
- Fast Frequency Hopping (MF-TDMA) combined with Rapid Bandwidth Allocation
- TCP/IP is very sensitive to BER. TPC Encoding ensures 10^{-9} BER, providing fiber like reliability
- Technological Superiority Allows Use of Much Smaller Antenna Sizes

TCP Performance Improvements

- Mitigates the effects of latency over satellite
- TCP Acceleration - Reduces overall bandwidth requirement, while enhancing performance
- Web Acceleration – Provides better HTTP performance
- Local DNS Caching – More User Satisfaction

Application Quality of Service

- Application QoS based on multiple parameters (Source/Destination IP Address, Source/Destination Port Number, 802.1q, VLAN ID, IP DiffServ & TOS Bits, Protocol Type)
- Network QoS – Provides application QoS even across multiple remotes sites
- Class Based Queuing – Assign percentage of bandwidth to each class
- Rate Limiting – Allocate only bandwidth that is needed
- Committed Information Rate – Dedicate bandwidth as required (Static and Dynamic)
- Built-in Jitter Handling for Realtime traffic such as Voice and Video.

Security

- Real Private Networks
- End-to-End VLANs (802.1q Based)
- 3DES Link Encryption (Only Remotes that Need it, even in a shared network)

Scalability

- Upstream from 64 kbps to 4.2 Mbps (Antenna and Transmitter Size May Vary)
- Downstream from 128 kbps to 9 Mbps [18 Mbps Q3 '04]
- Carriers can be configured in 1 bps increments
- Can easily add new remotes without increasing satellite capacity
- Equipment will Work With C, Ku, or Ka Band Satellites

Flexibility

- Star Topology
- TDMA Configuration
- Point-to-Point IP (SCPC) Configuration
- Star-Mesh Topology [Q4 '04]
- Mobile Application

Network Design Flexibility

- Support within one Hub for any satellite band C/Ku/Ka
- MF-TDMA allows for adding capacity to network without interrupting service
- Implement Multiple Real Private Networks within the same chassis
- Extensive Traffic Engineering Capability allows Better utilization and control
- Can create networks that range from high-oversubscription & latency to low-oversubscription & latency.
- Can support any TCP/IP application

Best Hub Technology

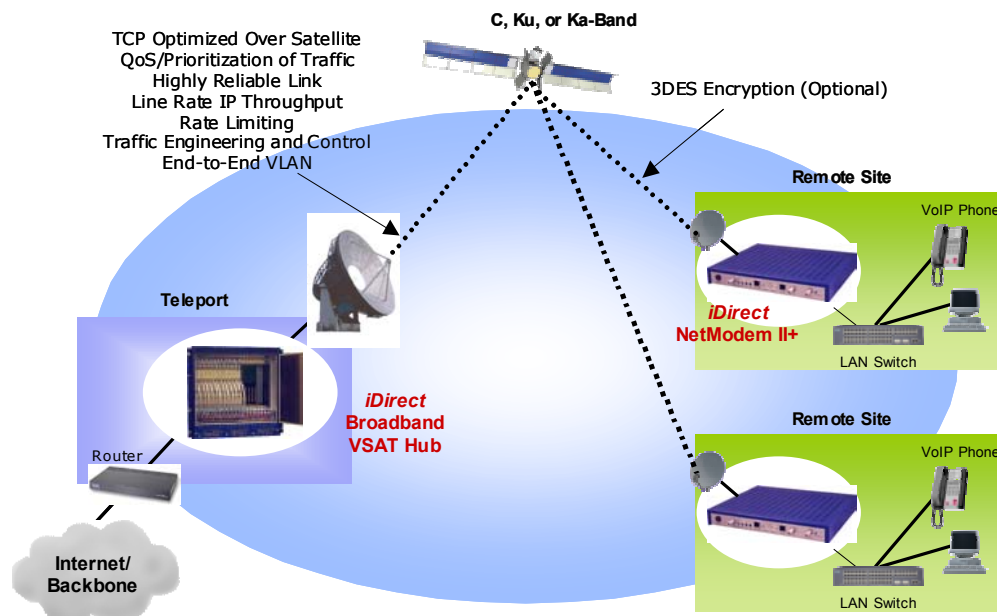
- Carrier Class – Fully Redundant
- Scale as you grow
- Very small footprint – 12U 19" Rack-mountable
- Support for Multiple Outroutes or Real Private Networks within the same hub
- Support for Multi-Inroute Network Architectures
- Single Hub can support up to 5 satellites at the same time

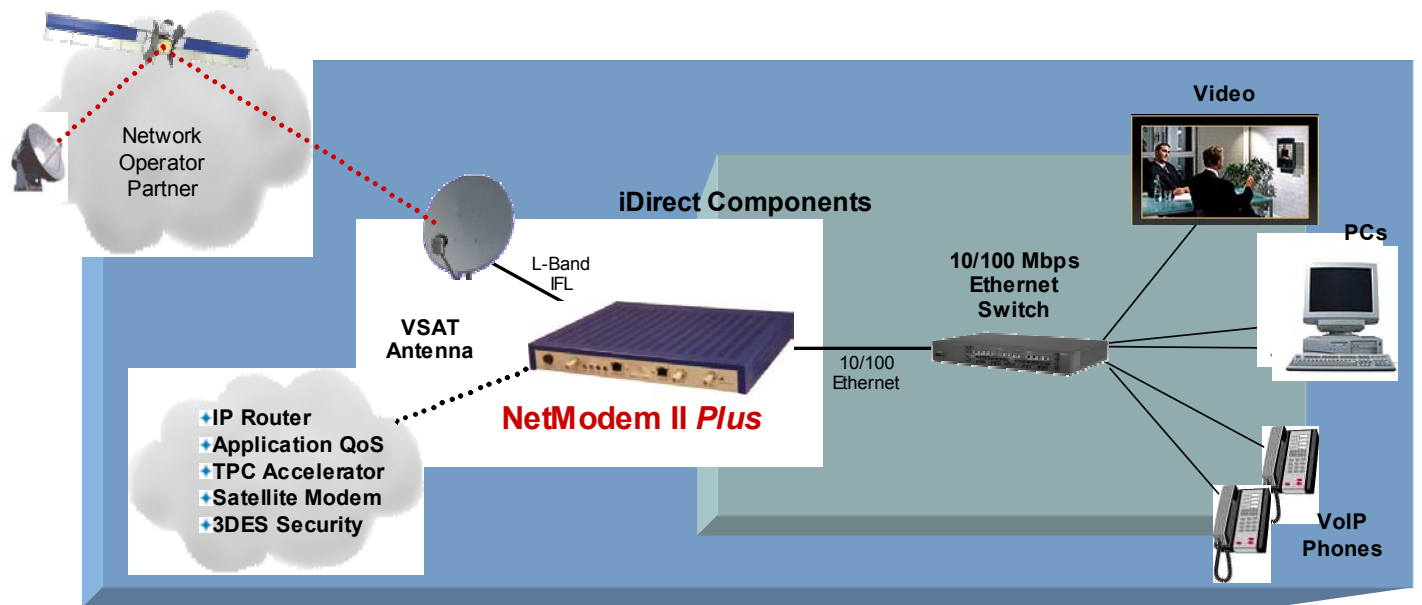
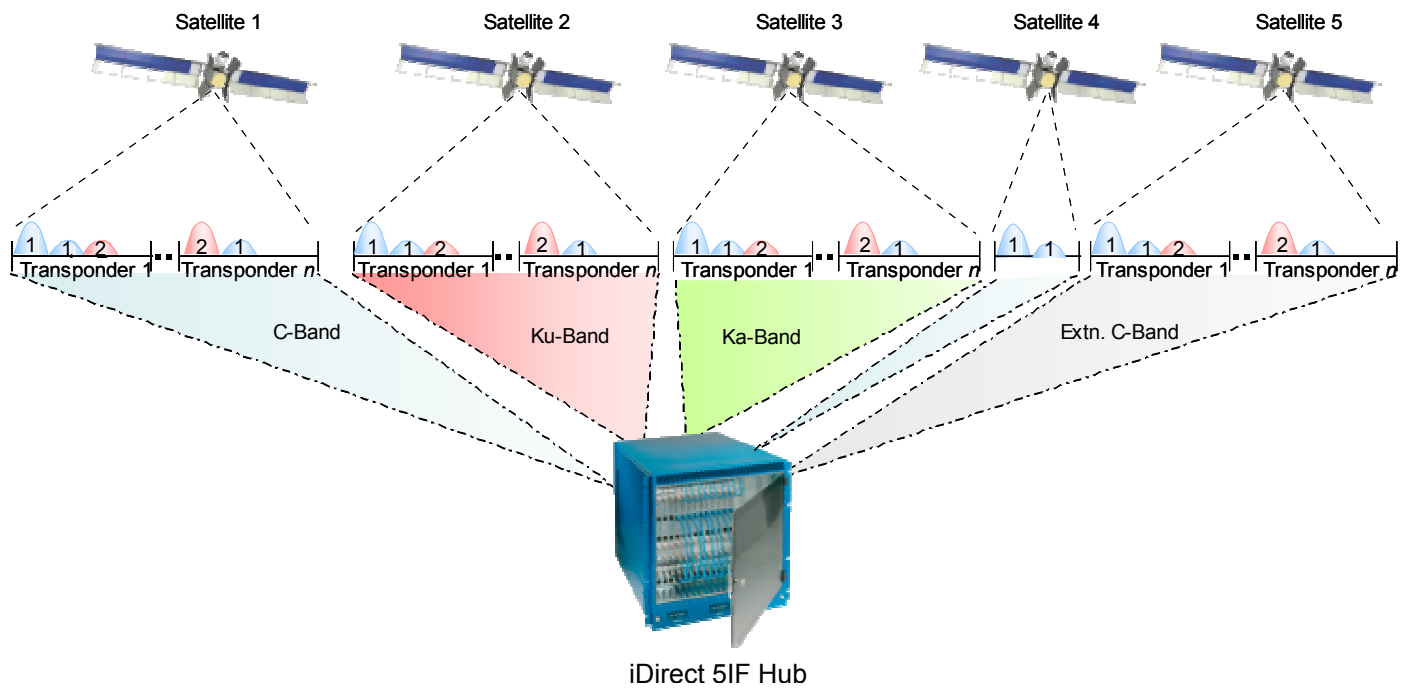
Highest Bandwidth Efficiency

- MF-TDMA (Fast) combines with D-TDMA ensures the most efficient use of satellite capacity
- Automatic Uplink Power, Frequency, and Timing Control ensure a very efficient TDMA Frame Structure
- Turbo Product Codes, on both downstream and upstream, allows one to implement power limited carriers
- Size carriers in 1 bps granularity
- CIRs, with a granularity of 1 kbps, can be configured to meet the exact requirements
- D-TDMA provides a 98% payload efficiency

Industry Leading NMS

- Completely Integrated NMS
- 3-Tier Architecture
- GUI Based for Ease of Management
- Scale to 1000's of Remotes and Multiple Hubs from one NMS
- Configuration, Monitoring, and Traffic Analysis
- SNMP Support
- IP and Satcom Statistics (Real-time and Historical)
- Central Management of all remote operations
- Multicast Software and Firmware Upgrades
- Remote Authentication
- Virtual Network Operator Support





A Typical Remote Site